INSTRUCTIONS FOR PARTICIPATING IN PROFICIENCY TESTING FOR WHOLE BODY, ELECTRONIC and EXTREMITY DOSIMETERS

The NVLAP dosimetry proficiency testing will be based on the American National Standard N13.11-2009 for Whole Body dosimeters and ANSI N13.32-2008 for Extremity dosimeters.

A complete test of a dosimeter model requires 15 dosimeters (21 dosimeters for category II) to be irradiated over a 3-month period in each radiation category for which accreditation is desired. The dosimeters are evaluated in terms of shallow and deep dose equivalent, as applicable.

Processors applying for accreditation for the first time, those introducing new models, or those required to retest failures, may select a starting date of their choice according to the following testing schedule.

1st Quarter - Whole Body (Initial/Renewal/Retest)
2nd Quarter - Extremity/EPD (Initial/Renewal)
3rd Quarter - Whole Body (Initial/Renewal/Retest)
4th Quarter - Extremity/EPD (Retest ONLY)

After the initial accreditation, dosimetry processors must perform proficiency testing of the dosimeter(s) every two years. If you have questions about the process, please contact Betty Ann Sandoval at 301-975-8446 or *betty.sandoval@nist.gov.*

Dosimeters, taken from the general population, must be submitted to the proficiency testing laboratory (PTL) in three separate groups, a group sent each month over the 3-month period. Each group must include five dosimeters (seven dosimeters for category II) of each model/type for each radiation category selected. Each monthly shipment must also include at least one shipping control and at least six extra dosimeters of each model/type to be used as spares. The first month must also contain two extra dosimeters to be used for photographing (dosimeters may have to be destroyed).

Dosimeters are shimmed to be parallel to the front face of the phantom and delivered doses are normally reported to the front face of the phantom. If you want the doses reported to the active element of the dosimeter, the offset between the phantom face and the active element must be reported on the registration form to the PTL.

Each individual dosimeter sent for testing must use a barcode provided by the PTL. The supplied barcode should be placed in a visible location on the front of the dosimeter. This code will be used to document/report the performance of each dosimeter.

Place all identical dosimeters in a separate container (plastic bag) and mark each container with the designation used for that model/type dosimeter. (If testing to ANSI N13-11.2009, you may only specify dosimeters for categories I and V. If testing to ANSI N13-32.2008, you may specify dosimeters for all categories.)

The dosimeters must be shipped to allow sufficient time for them to arrive at the PTL at least 2 (TWO) business days before the beginning of each month. Dosimeters received after the FIFTH day of a month may be returned unirradiated.

Please ship the dosimeters in a *sturdy container* that will survive a round trip through a parcel shipping system. Send the dosimeters to:

Battelle for the US DOE
Attention: Roger Gregg, NVLAP
Mail Stop: P7-03
790 6th Street
Richland, WA 99354.

Each month after the dosimeters have been irradiated, they will be returned to you via a private parcel system for evaluation. In addition, a reporting template specific to the dosimeters tested will be provided to you by the PTL for reporting. *Please provide the PTL with a name and an adequate shipping address (no P.O. Box) for the return of the dosimeters and a valid e-mail address for the reporting template on the attached registration documents.*

All evaluated doses must be reported back to the PTL using the supplied reporting template within 15 business days of your receipt of the irradiated dosimeters. *Failure to comply with this 15-day limit may result in all dosimeters in any affected test category being voided.*

Along with submitting the completed reporting template, you will need to send two additional items to the PTL. First is a printed version of the completed reporting template that includes an approving signature; second is a copy of the original data provided by your reporting process. (This second item is required as a back-up in case the added step of transferring your results to the supplied template creates a problem. This information will only be used as a reference when necessary.)

Send all hard copy testing results or any correspondence by U.S. Mail Service to:

Pacific Northwest National Laboratory
Attention: Debra Lucas, NVLAP
Mail Stop: P7-03
902 Battelle Boulevard
Richland, WA 99354.

You may make corrections/changes to your reported data until the PTL receives the data for the third month of testing.

The testing laboratory will send the results of your testing to the primary contact person within 3 weeks of receiving all of the PT participants evaluated doses.

If satisfactory performance is not demonstrated for a dosimeter in any category attempted, you will be informed by the PTL along with the test results. You will also be notified as to what retesting will be required.

If you need general assistance or assistance for special situations (such as damaged or lost badges or transit doses) or if you need to request that a badge(s) be voided, please call Debra Lucas at 509-375-7360 or Roman (Kim) Piper at 509-375-7339.

NEUTRON CALIBRATION IRRADIATIONS

Since it is proper to calibrate neutron dosimeters to the neutron spectrum in which they will be used, the testing laboratory will provide free calibration irradiations for neutron dosimeters. **THESE CALIBRATION IRRADIATIONS WILL BE PROVIDED ONLY THE FIRST TIME A DOSIMETER MODEL IS SUBMITTED FOR TESTING.** This calibration should be adequate for all future use unless otherwise notified.

If you wish to obtain a calibration irradiation, include FIVE dosimeters (TEN dosimeters if testing ^{252}Cf Bare and ^{252}Cf D_2O moderated) in a separate container that is clearly marked "FOR NEUTRON CALIBRATION" with the first monthly shipment. These dosimeters will be returned to you along with a report showing the neutron dose delivered.

SPECIFIC INSTRUCTIONS FOR ELECTRONIC PERSONNEL DOSIMETERS (EPDs) PROFICIENCY TESTING

Except as modified below, the overall procedure for proficiency testing EPDs will be the same as that specified in ANSI N13.11-2009. The performance criteria are the same as those required by ANSI N13.11-2009 for whole body personnel dosimeters. The registration form is the same as the one used for whole body personnel dosimeters.

1. The processor will submit five (5) EPD dosimeters (seven [7] if testing category II) each month, randomly selected from the dosimeter population used by the laboratory for personnel monitoring, for each category to be tested. The proficiency testing laboratory (PTL) will test the dosimeters to the ANSI N13.11-2009 criteria.

2. The maximum dose will be limited to the range of the EPD for all categories including the accident categories. The processor must specify the dose range and, if applicable, the dose-rate range of the EPD. If the range is not specified, the PTL will assume that there is no limit.

3. The units must be capable of being reset by the PTL.

4. Each unit needs a barcode supplied by the PTL in a visible location on the front of the EPD.

5. **The EPDs shall be shipped with <u>ALL</u> alarms turned off.**

6. Each model will be photographed in order to verify that the dosimeter model proficiency tested is the one used by the laboratory/processor. The dosimeters will not be taken apart unless specified otherwise by NVLAP.

7. The units should be shipped in such a state that they are clear of any recorded dose so the PTL does not overload the memory or display.

8. If it is necessary to use a separate read-out unit with the EPDs, then this unit, and the appropriate software and cables, must also be shipped to the PTL.

9. All units must be shipped with operating instructions; a complete manual should NOT be sent.

10. The laboratory must include six spares to be used in the case of obvious dosimeter malfunctions, such as battery failures, display failures, erratic function, and if the dosimeter indicates no response to the radiation exposure at all.

11. The participant should place a mark on the EPD if it is necessary to center the device at somewhere other than the geometrical center of the case. Unless this marking is called out to the PTL, the PTL will assume that the case should be centered over the reference point on the phantom.

12. REPORTING EPD RESULTS: The processor will read the EPDs and report the readings for all required and appropriate (e.g., some EPDs do not respond to shallow dose) test depths to the PTL via the supplied reporting template. Some EPDs report response in units other than personal dose equivalent (e.g., exposure (R or mR)). In such cases, the PTL will interpret the response as personal dose equivalent.

DATE: _____ **DOSIMETER CODE:** _____ **NVLAP LAB CODE:** _____

PROFICIENCY TESTING REGISTRATION - WHOLE BODY DOSIMETERS

Instructions: Complete this sheet for each dosimeter model that will be submitted for testing. At least **three months prior to testing**, send one copy to NVLAP by mail, fax, or e-mail to Betty Ann Sandoval, NIST, 100 Bureau Drive, Stop 2140, Gaithersburg, MD 20899-2140; fax 301-926-2884; e-mail betty.sandoval@nist.gov, **AND** send one copy by mail, fax, or e-mail to Debra Lucas, Battelle, for US DOE, Mail Stop P7-03, 902 Battelle Boulevard, WA 99354; fax 509-375-7340; e-mail debbie.lucas@pnnl.gov. In addition, include a copy with each group of dosimeters sent to the PTL.

Processor's Company Name: _____
Business Mailing Address: _____

_____

Primary Contact Person: _____
Phone Number: _____ E-Mail Address: _____

Name & Shipping Address for Dosimeter Return (if different from above): **(NO P.O. BOX)**

_____

_____

Phone Number: _____ E-Mail Address: _____

CALENDAR YEAR FOR PROFICIENCY TESTING: CY _____

Quarter		Scheduled Testing	Testing Status (circle one)		
☐	**Jan-Feb-Mar**	Whole Body	Initial	Renewal	Retest
☐	**Apr-May-June**	Extremity or EPD	Initial	Renewal	Retest
☐	**Jul-Aug-Sep**	Whole Body	Initial	Renewal	Retest
☐	**Oct-Nov-Dec**	Extremity or EPD	Initial	Renewal	Retest

Fill out the following information for each dosimeter model being tested (use a copy of this form for additional dosimeters if necessary) and check the appropriate categories from the ANSI N13.11-2009 standard:

TYPE OF DOSIMETER:
Processor Dosimeter Description: _____

Dosimeter Manufacturer: _____ Holder Manufacturer: _____
Dosimeter Model #: _____ Holder Model #: _____

Reader Manufacturer: _____
Reader Model: _____

Dosimeter Active Element Offset from Phantom (cm): _____*
*Only include this offset if you want the doses reported to the active element of the dosimeter.

BETA/PHOTON		***NEUTRON***	
Film	☐	TLD Albedo	☐
TLD	☐	NTA Film	☐
Electronic	☐ Range (if applicable) _____	Polycarbonate	☐
Other	☐ Specify _____	Electronic	☐ Range (if applicable) _____
		Other	☐ Specify _____

(continued on next page)

DATE: _____ **DOSIMETER CODE:** _____ **NVLAP LAB CODE:** _____

DOSIMETER ELEMENT DESCRIPTION

	ELEMENT 1	ELEMENT2	ELEMENT 3	ELEMENT 4	OTHER
Detector Type (i.e., TLD, OSL, TED)					
Detector Composition (i.e., Al_2O_3, CR39)					
Detector Thickness (mg/cm^2)					

ELEMENT FILTER DESCRIPTION

	ELEMENT 1	ELEMENT2	ELEMENT 3	ELEMENT 4	OTHER
Filter Material					
Filter Thickness (mg/cm^2)					
Other					

HANGER FILTER DESCRIPTION

	ELEMENT 1	ELEMENT2	ELEMENT 3	ELEMENT 4	OTHER
Filter Material					
Filter Thickness (mg/cm^2)					
Other					

WHOLE BODY *

CATEGORY I: ACCIDENTS, PHOTONS

I_A	General (IB + IC Random)	☐
I_B	^{137}Cs	☐
I_C	M150	☐

CATEGORY II: PHOTONS/PHOTON MIXTURES

II_A	General	☐
II_B	High E	☐
II_C	Medium E	☐
II_D	Plutonium specific	☐

CATEGORY III: BETAS

III_A	General (IIIB + IIIC Random)	☐
III_B	High E	☐
III_C	Low E	☐
III_D	Uranium Slab	☐

CATEGORY IV: PHOTON/BETA MIXTURE

Select Photon Category

II_A ☐ II_B ☐ II_C ☐ II_D ☐

Select Beta Category

III_A ☐ III_B ☐ III_C ☐ III_D ☐

CATEGORY V: NEUTRON/ PHOTON MIXTURES

V_A	General (V_B + V_C, random)	☐
V_B	^{252}Cf + II ***Select Photon Category*** II_A ☐ II_B ☐ II_C ☐ II_D ☐	
V_C	^{252}Cf(D_2O) + II ***Select Photon Category*** II_A ☐ II_B ☐ II_C ☐ II_D ☐	

***** *See ANSI N13.11-2009, Table 1a, p. 8.*

DATE: _____ **DOSIMETER CODE:** _____ **NVLAP LAB CODE:** _____

PROFICIENCY TESTING REGISTRATION - EXTREMITY DOSIMETERS

Instructions: Complete this sheet for each dosimeter model that will be submitted for testing. At least **three months prior to testing**, send one copy to NVLAP by mail, fax, or e-mail to Betty Ann Sandoval, NIST, 100 Bureau Drive, Stop 2140, Gaithersburg, MD 20899-2140; fax 301-926-2884; e-mail betty.sandoval@nist.gov, **AND** send one copy by mail, fax, or e-mail to Debra Lucas, Battelle, for US DOE, Mail Stop P7-03, 902 Battelle Boulevard, Richland, WA 99354; fax 509-375-7340; e-mail debbie.lucas@pnnl.gov. In addition, include a copy with each group of dosimeters sent to the PTL.

Processor's Company Name: _____

Business Mailing Address: _____

_____

Primary Contact Person: _____

Phone Number: _____ E-Mail Address: _____

Name & Shipping Address for Dosimeter Return (if different from above): **(NO P.O. BOX)**

_____

_____

Phone Number: _____ E-Mail Address: _____

CALENDAR YEAR FOR PROFICIENCY TESTING: CY _____

Quarter	Scheduled Testing	Testing Status (circle one)
☐ **Jan-Feb-Mar**	Whole Body	Initial Renewal Retest
☐ **Apr-May-June**	Extremity or EPD	Initial Renewal Retest
☐ **Jul-Aug-Sep**	Whole Body	Initial Renewal Retest
☐ **Oct-Nov-Dec**	Extremity or EPD	Initial Renewal Retest

Fill out the following information for each dosimeter model being tested (use copy of this form for additional dosimeters if necessary) and check the appropriate categories from the ANSI N13.32-2008 standard:

TYPE OF DOSIMETER:

Processor Dosimeter Description: _____

Dosimeter Manufacturer: _____ Holder Manufacturer: _____

Dosimeter Model #: _____ Holder Model #: _____

Reader Manufacturer: _____

Reader Model: _____

Dosimeter Active Element Offset from Phantom (cm): _____*

*Only include this offset if you want the doses reported to the active element of the dosimeter.

BETA/PHOTON		***NEUTRON***	
Film	☐	TLD Albedo	☐
TLD	☐	NTA Film	☐
Electronic	☐ Range (if applicable) _____	Polycarbonate	☐
Other	☐ Specify _____	Electronic	☐ Range (if applicable) _____
		Other	☐ Specify _____

(continued on next page)

DATE: _____ **DOSIMETER CODE:** _____ **NVLAP LAB CODE:** _____

DOSIMETER ELEMENT DESCRIPTION

	ELEMENT 1	ELEMENT2	ELEMENT 3	ELEMENT 4	OTHER
Detector Type (i.e., TLD, OSL, TED)					
Detector Composition (i.e., Al_2O_3, CR39)					
Detector Thickness (mg/cm^2)					

ELEMENT FILTER DESCRIPTION

	ELEMENT 1	ELEMENT2	ELEMENT 3	ELEMENT 4	OTHER
Filter Material					
Filter Thickness (mg/cm^2)					
Other					

HANGER FILTER DESCRIPTION

	ELEMENT 1	ELEMENT2	ELEMENT 3	ELEMENT 4	OTHER
Filter Material					
Filter Thickness (mg/cm^2)					
Other					

EXTREMITY *

CATEGORY I: HIGH-DOSE, PHOTONS

I_A	General (B and C, random)	☐
I_B	^{137}Cs	☐
I_C	M150	☐

CATEGORY II: PHOTONS

II_A	General	☐
II_B	High E	☐
II_C	Medium E	☐
II_D	Narrow spectrum	☐

CATEGORY III: BETAS

III_A	General (B and C, random)	☐
III_B	High E point source	☐
III_C	Low E point source	☐
III_D	Slab uranium	☐

CATEGORY IV: PHOTON/BETA MIXTURES

Select Photon Category

II_A ☐ II_B ☐ II_C ☐ II_D ☐

Select Beta Category

III_A ☐ III_B ☐ III_C ☐

***** *See ANSI N13.32-2008, Table 1, p. 6.*